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Coefficient of correlation between pH and alkalinity of sangmeshwar reservoir in osmanabad district, Maharshtra, India

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Abstract
The present study attempts to bring an acute awareness among the people about the quality of ground water by taking water samples from specific locations for analysis. During present investigation an attempt has been made to study the physico chemical properties of Sangmeshwar reservoir, Osmanabad district of Maharashtra State, India. In this paper an attempt has been made to correlate the pH and alkalinity of reservoir water.

Keywords: Coefficient of correlation, pH, Alkalinity, Sangmeshwar reservoir, Osmanabad

INTRODUCTION

Sangmeshwar medium project is a irrigation project which consist of a dam constructed across the river Manjra. It has command area on left bank and right bank canal. Left bank canal is 29.5 km in length and right canal is 30 km. Left bank having 70 outlets and 5 minors for about 1892-40 Ha command area. Right bank is for 1853.00 Ha command area with 49 outlets and 5 minors. There was need of on farm development works, via a network of field channels, various structures of field channels and water planning. The study of existence and the magnitude the direction of the relation between two or more variables is called as Correlation. The correlation helps to determine the degree of relationship between two or more variables. The degree of correlation is also called Correlation coefficient. Water samples were collected for the present study during June, 2009 to May, 2010 at regular intervals of every month in morning hour. The present work was undertaken to study the Coefficient of Correlation between pH and Alkalinity.

MATERIAL AND METHODS

Water samples were collected from the Sangmeshwar reservoir from June 2009 to May 2010.The samples were analyzed in the laboratory by using standard method described by Trivedy and Goel (1986) [8] and statistical analysis was done with the help of Mungikar (2003) [5]. The correlation coefficient (r) is calculated by formula.

$$r = \frac{\sum(X-\bar{X})(Y-\bar{Y})}{\sqrt{\sum(X-\bar{X})^2\sum(Y-\bar{Y})^2}}$$

Where 'x' and 'y' are any two parameters.

RESULTS AND DISCUSSION

Hydrogen ion concentration (pH) play an important role .As most of the chemical process are occurred at specific pH, at normal pH all enzymatic actions are normal. Any increase in pH may lead down the biochemical reaction. Generally high pH indicates higher productively. Davis (1955), Bhatnagar (1984) [2], Wetzel (1960) [9] reported high pH with photosynthetic activity. However, the presence pH range shows that water of this Dam was favorable for aquatic life Das (1978). During present study pH was ranged between 7.3-8.1.Similar results were also observed by Khare (2002) [4], Panda and Sahu [6] (2002) and Sedamakar and Angadi (2003) [3], Singh and Rai (2003) [7] and Bahura, C.K. (1998) [1].

The total alkalinity of water was due to carbonates and bicarbonates. It was observed maximum during the months of summer followed by monsoon and winter is due to concentration of nutrients in water and decrease in water level by evaporation. A decline in total alkalinity was observed during monsoon which may be due to dilution effect, where as the alkalinity was ranged between 22.18-.50.98 Mg/l .Results shown in Table no.1.

As the value of coefficient of relation between pH and Alkalinity (r = 0.515641), values shows correlation coefficient, hence there is relationship between variable i.e. variables correlated.

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Table 1 Shows values of pH and Alkalinity

Sr.	Month	X	Y	X^2	Y^2	Xy
1	Jun.09	7.3	34.83	53.29	1213.129	254.259
2	Jul.09	7.3	36.00	53.29	1296	262.8
3	Aug.09	7.4	38.99	54.76	2998.658	288.526
4	Sept.09	7.3	32.10	53.29	2839.824	234.33
5	Oct.09	7.5	25.20	56.25	3164.063	189
6	Nov.09	7.5	23.40	56.25	3164.063	175.5
7	Dec.09	7.5	22.18	56.25	3164.063	166.35
8	Jan.10	7.9	34.93	62.41	3895.008	275.947
9	Feb.10	7.8	50.98	60.84	3701.506	397.644
10	Mar.10	7.6	52.73	57.76	3336.218	400.748
11	Apr.10	8.1	47.00	65.61	4304.672	380.7
12	May10	7.9	47.00	62.41	3895.008	371.3
	N= 12	$\sum$**X =**91.1	$\sum_{Y}$=445.34	$\sum$**x²=**692.41	$\sum$**Y²=**36972.21	$\sum_{x.Y}$=3397.104

(r = 0.515641)

CONCLUSION

On the basis of these analytical findings, the following conclusions can be drawn. The pH and Total alkalinity values for the samples are within permissible limit. The values of correlation coefficients and their significance levels will help in selecting the proper treatments to minimize the contaminations of water reservoir of Sangmeshwar. There is an increasing awareness among the people to maintain the reservoir at their highest quality and purity levels and the present study may prove to be useful in achieving the same.

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